

# Welcome!

Hello! We're back again, and first may we thank you for making Retro Review such a success! Requests have really exceeded our expectations, and that's what makes writing this magazine to you so important and enjoyable.

There is so much to say and so little time and space that this issue will be a little larger than normal - we've had to restrain ourselves! The Retro market is becoming larger all the time, since we announced our magazine for the first time in September 2001 a lot of new user groups appeared, and a bunch of new sites have evolved. At least 2 other magazines are now trying to succeed in the retro-world: one, Retro Computing Today, is hoping to succeed as a commercial magazine, and Sintech has announced the English translation of their ZX Spectrum magazine. As for us, we would really like to see a Retro Magazine on the shelves of newsagents: maybe there will be, one day...

Lots of computers are classics, some computers are rare, but just because they are classics doesn't make them rare. I recall a couple of years ago, a guy appeared on IRC (#zxspectrum at irc.ptnet.org) bragging about a Super Rare Canadian Plus 3 his father had bought, and asking some kind of ridiculous sum for it. It inspired me to make my own creation, pictured above - the Super Rare Canadian Plus 3! Besides some funny stories there are plenty of hyped machines out there so take a look at our Auction Guide and decide for yourself if what's Rare is *really* rare or just L@@K R@RE...

About 20 years ago, a mark in Computer history was made: yes i know you've guessed it, its the all mighty ZX Spectrum! How many of us spent part of our childhood closed off in a room with the mean machine on? It's funny to see the myriad of home computers then available: almost every month these next years will be some computer anniversary, and all of them with so much to talk about.... but then that's what we are here for! Let's stop talking and start writing articles for you... see you next issue!

Retro Review Team



The one and only Canadian ZX Spectrum +3, now this is R@RE.



Rare ? Maybe or maybe not... Take a L@@K at our Auction guide and see!

# Index



## Driving your Spectrum

Retro Review Tests some Disk Drive systems for the ZX Spectrum, read it and choose your own.

Page 27

## Game Reviews



### Robotron

Page 8

*Back in the mists of time - 1982, in fact - Williams Electronics unleashed a game of pure psychedelia - thus was born Robotron 2084 in all its multicolour glory. But does it play as well as it shone then?*



### Yars Revenge

Page 10

*If awards were given out for weirdness, Yars` Revenge would be the one to beat. Ian Gledhill dons his Space Fly outfit to try and take on the evil Qotile and hopefully survive long enough to bring you this review...*

# INTERVIEW

Luca Carrafiello

Although many people still see the C64 as the platform of choice for retro-coding, there are still some who dispute that. One such coder is Luca Carrafiello, who is currently working on a new shoot-em-up for the Commodore +4, XeO3.

Page 12

# Regulars:

3 - Editorial

6 - News

50 -Auction Watch

## Sprinter Review

Finally my Sprinter computer has arrived, and I won't pass up the opportunity to share my impressions with all Retro Review readers.

Page 15



*Emulation: the Sincerest form of*  
  
**Flattery?**

Retro Review Makes a Round up of Commodore 64 Emulators, Choose for yourself

Page 45

## SIO2PC

Will your Atari thank you for this one ?

Page 35

At the tail end of what we at *Retro Review* call the Retro 'era', there was a new CD-based console released - even before the Amiga CD32.



Page 39

Panasonic 3D0 the FZ-1

Page 43



Ugrading The Amiga Tutorial Part 2 on Page 21

# News and Highlights

## Amiga OS 3.9 Boing Bag2 is Here

Amiga and Haage and Partner just released Amiga OS 3.9 Boing Bag 2, it features some bug corrections, in Programs like Amplifier, Play CD, Reaction, Hard Disk Support and several other things, this Patch comes in 3 archives, 1 containing the core updates, other with language specific files and finally a suport files update, you can get this update from Haage and Parter ([www.haage-partner.com](http://www.haage-partner.com)). Just make sure you have your OS3.9 CD handy, like the previous Boing Bag, this too rquires the CD to Install.

## Amstrads Intentions unveiled

As most of you should recall Amstrad was looking for ZX Spectrum Software Licenses, there was a lot of fuss but no actual news about it, finally Amstrad lift the veil and presents to all comon mortals a Phone by the name of Emailer Plus , well not just a phone, a computerphone that can run ZX Spectrum games, it looks quite good, and features a cool detachable keyboard, i dont have a clue about public acceptance of this machine, but if you plan to buy it for ZX Spectrum Games, i must warn you that you must PAY for the games, not only to download them but to keep playing them as the games do EXPIRE, reminds me of some arcades that whatever you played good or not you had to pay for the time you played, the phone has much more features acording to Amstrad, but those are behind the scope of our magazine, take a look at <http://www.amstrad.co.uk>, and let us know what you think about it, sure hope they dont make World Of Spectrum remove their ROMs.



This chap's happy face clearly states that he is not the one who pays the phone bill.

# Atari ColdFire Project has new Web Site.

Atari.org, one of the best atari sites hosts the new pages of Atari ColdFire project that according to them 'Our aim is to build a new Atari-clone based on Motorola Coldfireprocessors and make it available to the public at the lowest possible price', as one should know, the Cold Fire Processor is a 680x0 family processor wich is a cut down version of the 060, it runs in higher clock speeds and is much cheaper than a full flagged one, this really looks like an intersting project and is well worth a look, take a peek at their web site at <http://acp.atari.org>, and let us know what you think about it.



## Retro Review Wants to hear from you !!!

Hi, did you know you can send us your own news ?

No ???? Ok, then it must be our fault let us give you our addresses;

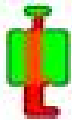
By email:

ideias@retroreview.com - For your ideias coments etc.  
subs@retroreview.com - Subsriptions Related mails.  
help@retroreview.com - For any doubt you may have.

If you dont have email, you can send us a Letter to:

Jorge Canelhas  
Apartado 3115  
Miguel Bombarda  
2745 QUELUZ  
PORTUGAL

Go ahead and tell us about you, and dont forget to visit our Forum at <http://www.retroreview.com>.



# ROBOTRON: 2084



**Back in the mists of time - 1982, in fact - Williams Electronics unleashed a game of pure psychedelia - thus was born Robotron 2084 in all its multicolour glory. But does it play as well as it shone then? Ian Gledhill takes a look...**

There`s nothing quite like a game with a good plot behind it, right? And *Robotron* is definitely nothing like a game with a good plot. Run around like a headless chicken, shoot things indiscriminately, and get disintegrated at regular (and frequent) intervals; that`s what *Robotron* involves. Probably not a good idea to play this game if you`re even vaguely

one for movement and one for firing direction. You need to be at least partially ambi-dextrous to stand a chance at this game, as it gets pretty (read: ridiculously) frantic at times. Wagging the joysticks in any old way works at first, but not for long....

The game starts off with a nice easy level, like any self-respecting arcade game should. The idea of the level - and of every level - is to annihilate the robotic bad guys as quickly as possible and rescue the good guys before they get demolished by the afore-mentioned androids. So, stroll around and shoot anything that moves. If it`s on your side it won`t be hurt, only enemies are killed by your bullets. Doesn`t this game sound easy? As it should: level 1 is a nice gentle introduction.

Onto level 2 .. a few more types of monsters.. more bad guys to kill.. more good guys to rescue (but that`s a good thing - you get points according to how many you rescue). Still sounds easy, right? OK, level 3 should still be easy... until you see the sheer quantity of beasties scattered around the level. And it`s not just moving things - there`s plenty of electrified obstacles for you to



*Even the HiScore table is made up of cycling colours. Not good for a headache!*

vulnerable to flashing lights, as this is a Williams Electronics game, and as such uses every cycle of the little 1MHz 6809 to great effect with its colour cycling.

What do people remember *Robotron* for most? Probably the joysticks - there`s two of them. No, not for two player mode (unless you fancy co-operating with a mate, anyway), but

avoid while trying to rescue the little people. Which is a good idea - for not only do you get points, but if you *don't* get them, the brain monsters that have just appeared will use them to create guided missiles which are not only very efficient at tracking down heroes, but are also devilishly hard to hit. Best be careful not to neglect those 'droid creating thingies though - best kill them before the level gets too out of hand. And then come the robots that fire at you too, as if you didn't have enough on your plate. And so it goes on, until you can barely move for waves and waves of bad guys - lucky you have a fully automatic weapon.

So the game is madly frenetic - but is it any *fun*? The answer has to be a resounding yes! It'll pick you up and you won't put it down, at least until you've beaten that hi-score you fluked a few goes ago. True, you die very easily in this game, but you also get lives very easily - so it's not disheartening when your entire go lasts approximately 30 seconds, as your next go could last 3 minutes. You'd have to be going some to beat Brian King's record registered

with *Twin Galaxies*, though - 348,691,680 is his score - I'm quite chuffed with my 2,000,000! It's truly amazing what Williams managed to do with such low power machines, but the amount of moving characters on the



*Looks busy doesn't it? This is just level 3...*

screen belies how primitive the processors used are: couple that with the vibrant sound effects and you have a very impressive and involving game.

My advice to any arcade players who haven't seen this game yet - if you can't find the original Arcade machine, grab MAME and a copy of the *Robotron* ROM (it's on the 'net) and get blasting!

### Control Problems?

*Robotron* is nigh-on impossible to control on the keyboard - two good joysticks are a necessity. For the true *Robotron* fan, a real arcade joystick like the *HotRod* is wonderful - truly the arcade experience replicated in your own home! Check out <http://www.hanaho.com> for more info. Expensive but worth it for Arcade freaks!

### Robotron- Williams Electronics Inc

Graphics	6
Sound	7
Playability	10
Longevity	9
<b>Overall</b>	<b>8</b>

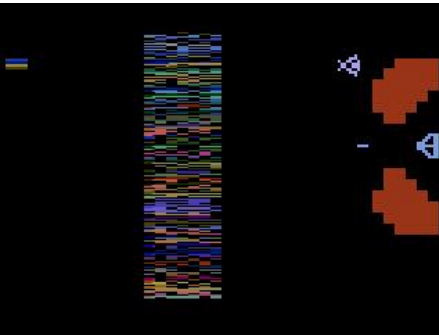


# YARS` REVENGE

***If awards were given out for weirdness, Yars` Revenge would be the one to beat. Ian Gledhill dons his Space Fly outfit to try and take on the evil Qotile and hopefully survive long enough to bring you this review...***

The entire task of this game could be summed up like this: "You see that thing on the right. Kill it. As many times as possible." There's nothing overly complex about this game - it's just *weird*.

The star of the show, Yar, is in fact a fly - or rather a "Fly Simulator" according to the manual. Luckily this fly



*That's me at the top right, with my Zorlon cannon (far left) about to blow the Qotile (far right) to kingdom come. Yay!*

happens to be able to shoot energy missiles, but they're pretty useless against anything except the Qotile's

shield. Unfortunately the same can't be said about the Destroyer Missile, which is particularly effective at trudging across the screen and wasting any unfortunate Yars that get in its way. Luckily there's the neutral zone (which, incidentally, doesn't have a Romulan in sight) in which the Destroyer Missile can't harm Yars. Not that the zone does anything good against the Swirl.

Confused yet? The whole game is set in this colourful (and noisy!) part of space where this sort of thing happens a lot, it seems. There's no shortage of bizarre effects, either - colours flash all over the screen constantly, accompanied by a weird background tone to make you really feel spaced out, so if the game wasn't confusing enough in the first place, the effect of it all would be enough to make anyone unsure of what was going on.

In actual fact, take away the overpowering presentation of the game, and you're left with a very simple jaunt around the screen biting shield bits. Nothing more nor less, really, but it's all delivered with such pazz as to make



the game feel really intense. All Yar must do is eat the shield. Eat a shield cell, and the Zorlon cannon will appear, but make sure you don't get hit by the Yar-seeking *Swirl* -even the Neutral zone doesn't protect you from that. This cannon is the only thing that can destroy the Qotile, so aim it carefully (the cannon is always on the left of the screen, the Qotile on the right), fire the cannon through the gap in the shield and blam! on to level 2 (via massively colourful explosion bars all over the screen, naturally). And that's it. On level 2, the only difference is that the shield is now a block of cells, which are rotating within the shape of the block. Once again, shoot the Zorlon cannon and it's goodbye Qotile, and it's back to the level 1 style of shield again. This goes on.. and on.. until you lose all your lives, so it could be a while if you're really good at the game.

But is the game worth playing? Simple answer: probably! It's an experience, to be sure, it's not very expensive at auction, so give it a whirl! One thing's for sure - you won't have another game like it...! Incidentally, *Yars' Revenge* is now out on the Gameboy

Colour, but we've not seen a copy yet...



*I'm hiding in the Neutral Zone - not that it's going to help much, what with The Swirl coming for me like it is...*

Yars' Revenge	
Atari	
Graphics	6
Sound	7
Playability	7
Longevity	7
Overall	7

### AtariAge to the rescue once more...

As usual the good folks at AtariAge ([www.atariage.com](http://www.atariage.com)) have everything you need if you want to try your hand at some vengeance Yar-style. In fact, not only do they have the NTSC ROM twice and PAL ROM once, they even have a South American version! Plus, to cap it all, they have the manuals in both ASCII and scanned form, in case you have the cart and no box (they even scanned in the box artwork).

So why not take a trip to [www.atariage.com](http://www.atariage.com) and download *Yars'* and *Stella* for whatever platform you're using? And then of course go and buy the cart as it's never quite the same on the emulators!

# Personality of the month

Luca Carrafiello

Although many people still see the C64 as the platform of choice for retro-coding, there are still some who dispute that. One such coder is Luca Carrafiello, who is currently working on a new shoot-em-up for the Commodore +4, XeO3.

RetroReview thought it was about time the +4 received some well-deserved airtime, so here's our interview with a modern day +4 coder!

RR: Hi Luca! Those outside the C16/+4 community might not have heard of you before - can you tell us a bit about yourself?

LC: My name's Luca Carrafiello, I'm 29 and live in Florence, Italy. I've graduated in Materials Physic Chemistry and work as researcher of University of Florence, Italy. After this primary school-ish presentation, some most important: I'm a proud Plus/4 owner since 1985, and proud member of one of the last Plus/4 crews alive nowadays: FIRE (Fantastic Italian Research Enterprise).

RR: Probably the most obvious question - why the +4? The C64 had better sprite and sound handling (after all, the TED chip was never really meant for games, right?).

LC: Well, when I was younger I was surprised by the most complete Basic V3.5 implemented on the Plus/4: sound, graphics and many other features are directly managed by it. Add also the big colour palette and the innovative design, and the hunger starts for the black box! In those days, I had a sincere hate for the POKE instruction, as the C64 Basic needs a large use of it in order to do

anything noisy or coloured. Afterwards, I discovered the built-in assembler of the C264 series, useful and nice to start learning...

In that time, the market allowed 16K games, in order to cover both C16 and Plus/4, so I began to believe it was the real reason of the lower level of the games compared to the C64. I'd just learnt the bad lesson regarding TED sound, so lame compared to SID, but the real asskick was the crude knowledge about the sprites: my adored Plus/4 has no hardware sprites!

Aaargh!

I'd got a lucky break entering the Plus/4 scene at its apex, and I understood that there are many good coders on the blackbox too, squeezing it as much, especially from Hungary. It was a cute scene, in which there were a lot of cool dudes using the better programming Plus/4 at the best level.

RR: How many people do you estimate are still using +4s? Is the scene still alive and producing software?

LC: After its birth and its death, actually the scene is...mmm..zombie-ish.

As graphician, musician and diskmagazine publisher, I'm really

active, but other users prefer to talk about hardware and emulation. I say it continuously: don't retrocompute, retrocode! Sometimes, nice projects begin, as the "16K Demo Compo" by Lavina of Gods Of The Universe (GOTU), and others find its good end, like "SidWinder V01.23", a music editor based on the original Taki's and coded by TLC of Coroners for both C64 and Plus/4. All the Plus/4 VIPs had subscribed to the Plus/4 mailing list at [c64.rulez.org](http://c64.rulez.org), but many other users still don't use the net in order to spread stuff and news, like the German scene, formed by 'serious' blackbox owners.

How many? Mah....don't know an exact quantity.

RR: How long have you been using your +4? XeO3 seems a pretty ambitious project....

LC: XeO3 is the dream of a lifetime. I dreamt about drawing sprites and animations, about compulsive music and big bosses to destroy. Now Mike Dailly had given me the chance, and I don't wanna lose it.

RR: How are you coding the game itself? Do you use an emulator or a +4 native assembler?

LC: I'm not the game coder because I'm not a coder. Mike should use one of the many assemblers available for pc nowadays.

RR: What are the main hardware limitations you've found when coding the game?

LC: Agh, you hit the weak point. There are so many limitations to constrain me I've put a chapter on my site regarding it.

First of all, the sprites. Nine 2x2 software sprites steal a lot of the character map and require 2 charsets. The direct consequence is a critical loss of memory for graphics, so I must make immortal jumps in order to push big bosses, enhanceable weapons, turrets, fonts, background elements in 170 characters.

Apart from the common graphic elements, only 98 chars are available for any level and any boss. Let's imagine, I have 42 characters only for the panel and fonts, and it would mean  $42-28=14$  chars!

The sprites are too small, and I've done the impossible in order to draw and animate something recognizable. Having said that, I'm very proud of the shell-shaped main ship I drew.

Often, the tragedy of colour clash, caused by the lack of hardware sprites: probably any level will be 3-coloured (+background) only.

The sound will be based on the SIDcard technology, a well-known device for Plus/4 users. Mike and I are discussing a TED player, a little code that doesn't steal too much rastertime to convert SID music to TED notes and volumes.

RR: What tools do you use for the level design and sprites? Are these done on a +4 or do you use tools on another computer?

LC: I draw all the graphics and compose all the musics on my Plus/4, because I'm married to the 'emulators suck' philosophy. Particularly, I draw the graphics and sprites with the Moldi's Logoeditor, a Plus/4 editor I love; musics are composed on the cited SidWinder V01.23. About levels, a cool dude, Fatman of Diamond Software coded for me a great background editor working

on pc.

RR: I notice all the music is done using a SID chip. Is this the same as the C64 sound? Do you program it in the same way as a C64 coder might?

LC: Yep, sure. All the HVSC fans can listen to my musics, and notice the deep difference between musics from year 1999, done with a SIDcard plugged in the blackbox, and preceding ones.

RR: Now a bit about the game itself: I notice the name is the chemical symbol for "Xenon TriOxide" - is this coincidence or are you using the games Xenon and Xenon 2 as a guide in your game design?

LC: Pure coincidence, also because the "Xenon" series consider vertical scrolling shmups and not horizontal ones. As chemist, I'd put in relation this game to the dangerous instability of this chemical compound under certain circumstances.

RR: Does XeO3 have a plot or is it simply an old-fashioned if-it-moves-kill-it shooter?

LC: I'm wondering about it. The gameplay is simple as we wanted, plus a little coin collection in Mario style. I just thought about a little intro sequence and a final. Often, I absolutely need a storeable hiscores table!

RR: How big will the game be? Will it fit on one 1541/1551-compatible disk?

LC: Probably, one disk.

RR: How will the game be distributed? Will you expect to make any profit from this game?

LC: Eh? Are you joking? I won't be the killer that hits a lifeless Caesar with the last slash! If the game will be ready in the X day, you will be able to download it in the X+1 day!

RR: If our readers want the full "XeO3 experience" they'll need a SID chip - where can one of these be found?

LC: All the Plus/4 emulators have the SIDcard option. Solder of Synergy still sell SIDcards:  
<http://solder-synergy.de/plus4/>

RR: Is there anything else you'd like to say to our readers?

LC: If you out there are a Plus/4 user, you must read my diskmagazine at:  
<http://plus4.emucamp.com/lone.htm>  
or  
<ftp://c64.rulez.org/pub/plus4/>

Important note: don't retrocompute, retrocode!

RR: Thanks, Luca, for your time. We'd like to wish you every success with the game and we look forward to firing it up ourselves!

We'd also like to remind the reader that Xeo3 can be found at (surprisingly):  
<http://www.xeo3.com>

Once again, we'd like to thank Luca for taking the time to do this interview. Watch this space for another interview with someone breaking the mould and doing his bit for RetroComputing!

# The machine that came from the cold

## Sprinter™

Finally my Sprinter computer has arrived, and I won't pass up the opportunity to share my impressions with all Retro Review readers.

For the less connected people out there, the Sprinter is a computer made by Peters Plus (a company based in St. Petersburg, Russia) that has a "Flexible Architecture", meaning that it is not strained by hardware configuration but has a changeable architecture. The heart of this machine consists of 2 chips: the Z84C15 Zilog microprocessor and the Altera EP1K30QC208-3 PLD (Programmable Logic Device\*). Besides these, it features an IDE disk interface with CDROM support, Floppy disk drive support, 4 MB of RAM, 64KB of FAST RAM, 256/512 KB of Video RAM, Stereo DAC, Real Time clock, 2 ISA Slots, Printer Interface and Analog Video output via RGB/SCART.

So whats so amazing about this machine ? Well, mainly its Flex Architecture! The PLD allows some hardware independence, that can be used to emulate (although emulation can not be the precise term) other machines like the ZX Spectrum, Pentagon, Scorpion and others that Peters is working on (ill reveal some news later in the article). This is all achieved by the Altera PLD... imagine the PLD like an Architecture emulator, a chameleon chip that can take the form of many computer architectures; like the



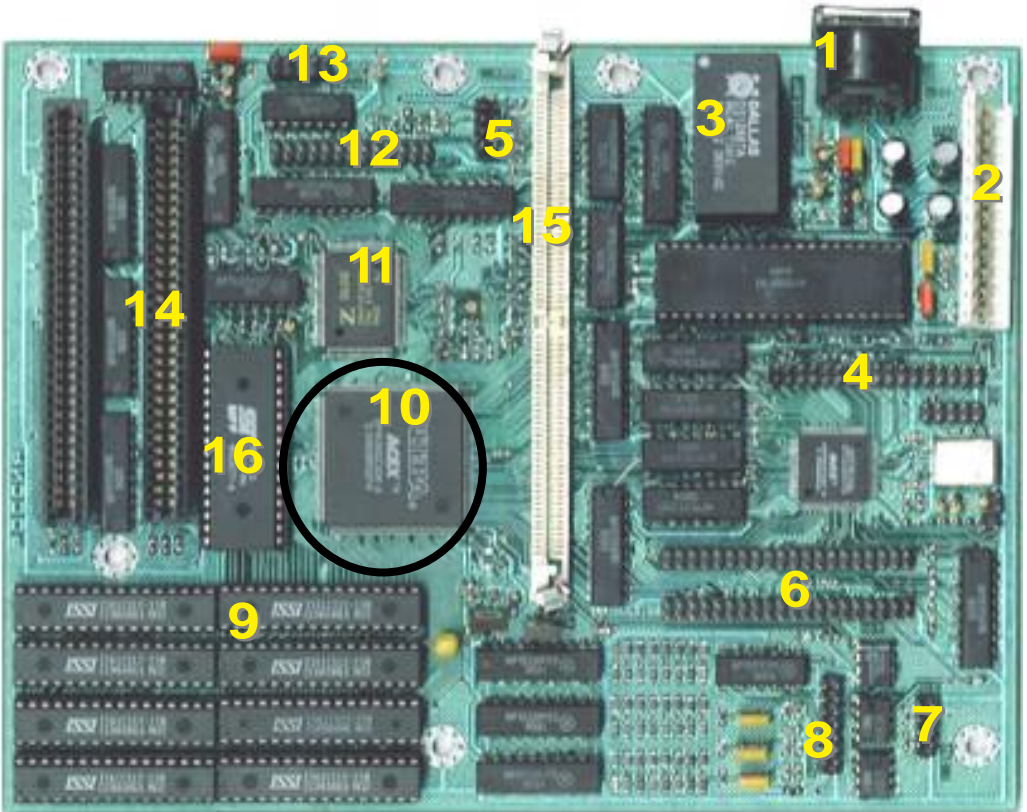
name says, a Logic device that can be programmed at our (read Peters) will. So, we take the Z84C15 (Z80) and transform the Altera into all other ZX Spectrum custom hardware, including the AY chip, and we have a fully working ZX Spectrum out of our Sprinter! Great eh?

### The Sprinter is NOT a ZX SPECTRUM

One thing that Peters has asked us to put very clear is that the Sprinter is NOT a ZX Spectrum clone! It is a computer that can act as a Spectrum, so if you think you going to find a standard look micro computer, you are wrong! As soon as you open the box you will find a

motherboard, several cables and 3 user guides. The guides are small and lacking in information, but enough to get you going. You should start with the assembly guide that teaches you how to correctly set up your new computer; the other two guides cover the Sprinter system and OS and its ZX Spectrum mode.

The Board is well-built and shows some quality: no wires hanging around and wire jumpers patching design bugs, but it's funny to see so many chips (probably logic chips) in their Russian form. The board's Baby AT design fits perfectly in a standard PC AT case. A picture of the board is below.



TOP -The Sprinter board : 1) AT Keyboard Connector, 2) AT Power Connector, 3) Dallas Real Time Clock and CMOS, 4) Floppy Disk Connector, 5) Joystick / Tape Connector , 6) IDE Connectors, 7) Sound Connection, 8) Video Connector, 9)Video RAM, 10)Altera PLD, 11) CPU, 12) Printer Connector, 13) Mouse Connector, 14) 8bit ISA Slots, 15) SIMM RAM Connector, 16) Sprinters BIOS.

The Altera PLD is the heart of Sprinters FLEX architecture.



The Altera PLD:

In short terms a PLD is a Programmable Logic chip, that can be programmed to make Logic circuits. This is what allows the Sprinter to be so 'Flexible': in theory almost any Z80-based machine can be 'made' from a Sprinter.

## The Price is Great.

So start saving money to get one. Money, did I mention money? Well maybe you dont have to save that much! The Sprinter board retails at a fabulous \$115 USD, all you have to do is throw in your AT case, disk drive and HDD! This price is a really nice surprise: if you want to go for ZX Spectrum scene, I doubt you'll get a better deal than this.

## SPRINTER DOS

Sprinter has a DOS of its own, but to be honest I find the DOS lacking in many features. The most noticeable is the lack of a FORMAT command, which in my opinion is the only really important thing lacking in ESTEX. Other things such as a simple type are not included in the DOS either (but have no fear! The Retro Review crew is developing some DOS commands: see the Archive section on our site <http://www.retroreview.com>). Redirection and pipes also don't exist on the Sprinter: you can't do a DIR >dir.txt. File management under DOS is also troublesome: no rm -r (or deltree for MS DOS users). Fortunately, there is a little application called FLEX

Navigator, (see pic below). This app reminds me of DiskMaster for the Amiga, or Midnight Commander under \*nix machines. With it you can move large quantities of files. Please note that you have absolutely no control over the CDROM under DOS: there are 2 applications, for CDROM viewing and Music CD Playing. Flex Navigator also allows you to execute files from it, but you cannot archive files with it (there is the ZIP utility for sprinter).



Flex Navigator the file manager for sprinter computers

## SPRINTER DEVELOPMENT

The Sprinter's CPU is a Z84C15, 100% compatible with the Z80, so Z80 assembler knowledge is very useful - especially as you don't have much more to choose from! Apart from Z80 assembly there is a FORTH compiler, so for now its easy to choose! I'm not exactly a FORTH fan but it's a powerful and simple language. The editor is also very simple: for the assembler part you can use MASM wich is in beta and has just been released. In my opinion the best tool for assembly for the Sprinter is using TASM on your PC to make the files! A development enviroment for the Sprinter is a MUST: the easier the software is to develop the more programs will be available; programs are a computer's life! There are plans to



make a C compiler for the Sprinter based on HISOFT C, this would be very welcome.

If you plan to develop using assembler, be sure to visit Peters Plus page often , and dont forget to download ESTEX function lists!

## ZX Spectrum mode

Although Peters keeps saying that the Sprinter is a computer of its own and *not* a ZX Spectrum clone, it's obvious that one of the main attractions of the machine is its Spectrum mode. When you boot into Spectrum mode (either by skipping DOS loading or by typing SPECTRUM on the command prompt) you will be presented with a TR-DOS Spectrum screen. Sprinter supports all functions from TRDOS (you still can't format a floppy from here) and adds commands of its own. These new TR-DOS commands are here to take advantage of Sprinter's hardware improvements, such as large RAM, HDD etc..

The ZX Spectrum menus are of course different from the real Speccy ones. The most noteworthy is the "Hardware" menu that gives you access to the hardware selection list. Here you can choose what Spectrum model/clone is 'emulated' - you can choose from Sprinter ZX, ZX Spectrum, Pentagon 128, Scorpion 256 and Pentagon 512. The machines are almost perfectly emulated (note i say almost because Peters says that it is 99% compatible! for what I tried it all worked well and I found a 100% program compatability). Another intersting menu is the options menu: here you can swich the Turbo On and Off. It's worth noting that although the Sprinter runs at 21MHz, owing to slower memory speed, the Sprinter



Fatality intro from Quadrax game

actually runs at about 10 MHz! So, Spectrum games and applications are NOT 7 times faster! Most demos don't show any speed improvement due to the fact that they are synced with the ULA timings and screen drawing routines.

There are 2 ways of getting your Sprinter to load spectrum software: either by TRD images, (which can be found on the web or made using an emulator that supports the format), or by the use of a sound cable that Peters do not include. Having said that, once you get a grip on TRD images I doubt you'll want anything else.

Something I think the Sprinter lacks in Spectrum mode is a sort of Multiface-like magic button (see box-out on next page). It would be very useful for tape loaded programs to be saved into TRD.

## DOOM

One of the first things a new Sprinter owner will notice on his CD (well, CD-R actually - the production run *is* rather small!) is an intriguing directory called "DOOM". Sure enough, once you've actually got the directory onto your Sprinter's hard disk (which is no mean feat considering it's 14MB and you can't copy from the CD-ROM - most people use a PC but I wrote a split/join program

- check the archive section of our website for more details!), running the program comes up with what appears to be Doom - almost!

In fact it's a technology demo.. you can run around the specially-designed map, at about 10 frames per second, and shoot, and see monsters - but the monsters don't move or anything. But it does demonstrate the hardware zooming of the machine, to achieve a frame rate which really isn't bad on an 8-bit machine! I can't imagine it'll ever become a full game as it's take a lot of work to fit all Doom into 16K chunks of RAM, but nonetheless it shows what the architecture is capable of.

In the right hands, there's nothing to stop a 3D Doom-like game appearing, but I think the Sprinter users are more likely to be into Space Invaders in terms of games - and probably own at least one PC to play Doom on anyway- but it's still good to see that it can be done

## Future Plans...

As you've probably noticed by now, the Sprinter is a very young machine. There isn't much software for it, but things are changing rapidly: many things are planned for the Sprinter, and a lot more appear every month. Among several other things, Peters Plus is planning (and making a poll of right now on their Forum) CP/M implementation for the Sprinter. Applications are being ported to the Sprinter too: MASM80 is here, Hisoft C is Planned and many other things are already being considered. One of the most exciting things I've heard is MSX emulation! That would be just great: Peters has told me that its being looked at, and, possibly will be subject to a poll in Peters Plus Home Page, so if you are a MSX fan keep looking! Your vote will be important when it comes to make the decision.

A great place to express your opinions is Peters Plus Forum on their webpage. Peters is very democratic when it comes to developing.

## Sprinter Emulation

Yes, you read it well, despite the machine being quite new, there is already a Emulator being written by Shaos, see <http://www.shaos.ru>, and it is called Sprint. The emulator is still in very early beta, and it's still being distributed in the form of a snapshot of the Source code directory of the developers machine. It aims to

emulate Sprinter mode of the Sprinter: it will not emulate ZX Spectrum modes.

This emulator is being distributed under GPL (Gnu Public Licence), and it is worth a look, we reckon.



a

## In Conclusion

The Sprinter lacks software of its own, but on the other hand has thousands of ZX Spectrum programs that can be used on it. Plus, Peters is developing in a very good rhythm: just take a look at their page (<http://www.petersplus.com>) and you will notice the fast growing rate of additions to the site. Furthermore when Peters completes the MSX mode another bunch of software will arrive and MSX games tend to be very good indeed (check the Penguin Adventure review last issue).

Peters Plus Support is one of the best I ever seen: they don't leave a question unanswered, and are extremely helpful with any problem you can find.

Finally your machine does not have the risk of being outdated by a later Sprinter model very soon, as Peters will make many of their upgrades software only (remember the heart of the Sprinter is the Altera PLD).

In my opinion this machine is indispensable for any Retro Fan, it really takes me back to when computing was actually fun!

*Jorge Canelhas / Ian Gledhill*

## How to Buy a Sprinter

So, you liked it ?

You want to get one for yourself ?

Buying a Sprinter is easy, just go to Peters Plus homepage, and send a mail to them. They will give you precise instructions on how to order - the main problem when ordering one is P&P price, as there are still no retailers or distributors of the computer. I believe that's about to change, but for now, just type <http://www.petersplus.com> on your browser and send an email.

### What rocks :

- The concept, the machine is great for flexibility and Power.
- The price, it's very cheap.
- ZX Spectrum emulation.

### What sucks :

- The DOS, still very immature.

# The SCORE 95%

### What is a Multiface?

The multiface was produced by Romantic Robot and is one of the best peripherals you could get for your ZX Spectrum. It allows you to stop a program execution and perform several operations (mess with the memory, save snapshots, etc..) It also allowed you to load special programs that stood resident in its own memory like the GENIE Disassembler, that allowed you to see a assembly listing of the current memory contents. It was the kind of interface that once you used it you couldn't live without anymore.

# UPGRADING THE AMIGA

## Part II

Hi again! Last issue we saw which Amiga models to choose and which to avoid - we also took a look at the upgrade path of our 'chosen' Amigas except the 4000. This issue we will take a look at Amiga 4000 upgrading and the PCI solutions out there.

### *Upgrading the Amiga 4000*

If you remember last issue, there are 2 models of Amiga 4000: the Amiga 4000 Desktop and the Amiga 4000T. The Amiga 4000 Desktop comes in two variants: the 4000/040 and the 4000/030. Now if price is an issue to you and you can get the 030 cheaper than the 040, go for the 030 since we will be removing the processor board from them - both Amiga 4000 Processor boards are outdated. The Amiga 4000T is probably the most sought-after Amiga: a big box Amiga full of Zorro slots and space to put stuff. It also comes with a SCSI interface, which is lacking on the 4000D.



On the left, an Amiga 4000 Desktop and on the right an Amiga 4000T.

As with all Amiga models, the 4000 is lacking in memory and in display capabilities, so our first choice would be to add more RAM. You can have up to 18MB with a bare Amiga 4000, which is not enough for most things these days, so what to do? You have 2 choices: find a Zorro III ram expansion, which is expensive and hard to do, or get an accelerator card (PowerPC if possible) that allows you to add RAM (most allow up to 128 MB which is more than enough for most stuff that you can do with an

Amiga). For adding such a board you have to ditch the A3640 or 30 that was in your 4000. Don't be sad! they're both rather poor: the A3640 is buggy and gets very hot and does not allow burst mode at all. Most people can't tell the difference between an Amiga equipped with the 040 or the 030 in everyday apps when they are using Commodore processor boards.

Which Processor board to choose ?

This is easy - get the fastest possible! I prefer Cyberstorms. Although the support is bad (from opinions on the web) they are the only ones still in production and they are very good and reliable. Also they come with a very fast SCSI interface: get the PPC one as a lot of software takes advantage of it and the difference in price between a 060 and a 060+PPC isn't too large (considering that the boards are very expensive indeed). Graphics Card Expansion and PCI bus Expansions should also be taken in account when choosing a processor board: there are some cards that only work on Cyberstorm Processor Boards, but we will talk more about that later.

Getting a Graphics card.

As important as the processor speed and often overlooked is the graphics capabilities of your Amiga. You communicate with your Amiga via 3 devices: Keyboard, Mouse and Monitor. The last is how your Amiga talks to you, and its very important. Besides, in terms of speed all Amiga graphics modes are slow and in terms of resolution/colors all are pretty outdated. This bring us to the pivotal question: which graphics board shall I choose ?

There are plenty of choices here when



compared with processor boards, but for the best money/performance ratio, you should go for a Cybervision 64/3D. These are still in production and can be easily found on eBay at reasonable prices. Another choice (expensive one) is the Picasso IV which is for many Amiga users the best board you can get. If you have a Cyberstorm PPC or MKIII card you can also go for the CyberVision card which is pretty fast and powerful. Putting all these aside, the most important thing you must consider is that whatever brand or model you choose, get a RTG card, so that you can use WB and other applications with the graphics card.



# PCI

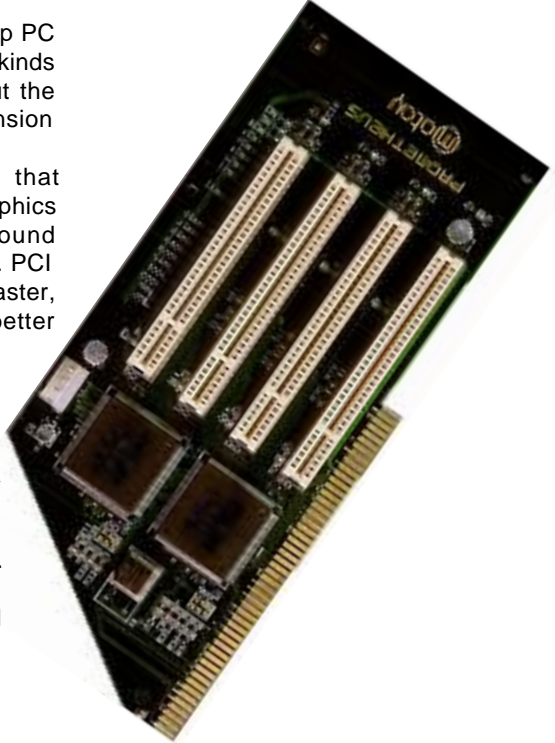
## Getting PC Hardware to work on your Amiga

Today's Market is flooded with cheap PC expansion boards. You can get all kinds of stuff for the PC, but what about the Amiga? Don't we have any expansion devices for a cheap price?

With a PCI bus, now we have that option too! You can get from Graphics cards to network adapters, sound boards, TV boards and much more. PCI is here and it's here to stay - its faster, cheaper and in many cases of better quality than Zorro cards out there.

### Getting PCI to your Amiga

About 2 years ago, the Amiga market saw the appearance of several PCI solutions for almost every 32 Bit Amiga model. Choosing from them is not an easy task but before you buy a PCI solution you must see if you can get it inside your Amiga! This is



## Towering your Amiga

One thing most Amigas lack is expansion space. This problem, however, has been solved for some time now with tower cases for Amiga computers.

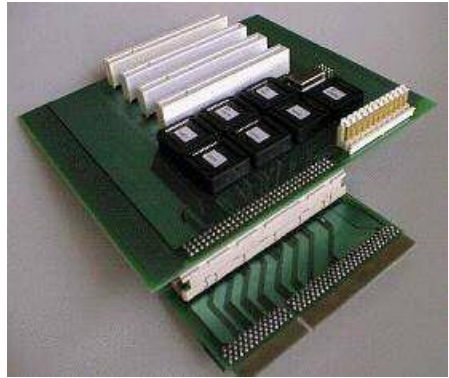
When it comes to choosing the box you have two options: you can either get a PC case and a metal saw and start hacking, or get a purpose-built amiga case. These are much more expensive but much better made and usually have all the bells and whistles so you can connect all your Amiga expansions and widgets. The most famous towers that are available are from Power Computing (<http://www.power-c.com>) and from Eyetech (<http://www.eyetech.co.uk>); both are pretty good towers, and you should get one of these if towering a 1200.

Towering brings benefits in terms of space saving, overheating and expansion, so if you have a small box Amiga get a tower for it. It can't hurt and your Amiga will thank you!

especially important if you have an Amiga 1200; buying a tower is the best solution to have space inside your Amiga (See previous page box out text).

## Which PCI to choose ?

There are several PCI solutions out there. The most famous ones are (in order of appearance in the market): the Mediator made by Elbox (see [www.elbox.com](http://www.elbox.com)) , the G-Rex made by DCE and the Prometheus made by Matay (check [www.matay.com](http://www.matay.com)). The Mediator PCI for Amiga 1200 was the first PCI solution to appear, then the G-REX arrived providing ultra fast PCI but only to those with a Blizzard PPC card on their Amigas. The most versatile option is the Prometheus, being a Zorro3-based board it allows Amiga 3000T and 4000T users to put PCI in their machines. Today Mediator also has a big list of PCI adapters that fit all sort of 32 Bit Amigas, but what makes the Prometheus so accessible besides the fit all Zorro Amigas fact ? Simple! Quoting Matay's site: 'A completely FREE software development kit for programmers. There is no need to sign NDA and no additional fees - we want to make "Prometheus" the most open PCI bridge solution as far as the drivers development goes'. So developers all



Mediator 1200.

around the world can build drivers to support their hardware and alter drivers made by others to meet their needs. Currently the most popular PCI card is the Voodoo graphics card. All PCI solutions support this card, and network adapters are also very popular. In terms of speed all PCI solutions perform neck and neck in most aspects: the Mediator has a little edge over the others, but I believe the free SDK from Matay is a very important feature to leave unnoticed. In terms of design (and i won't talk much about Amiga 1200 expansion here, because I really believe the 1200 is just too much over-expanded these days) the Mediator kicks ass. These boards look perfect and fit perfectly on every model I saw. In



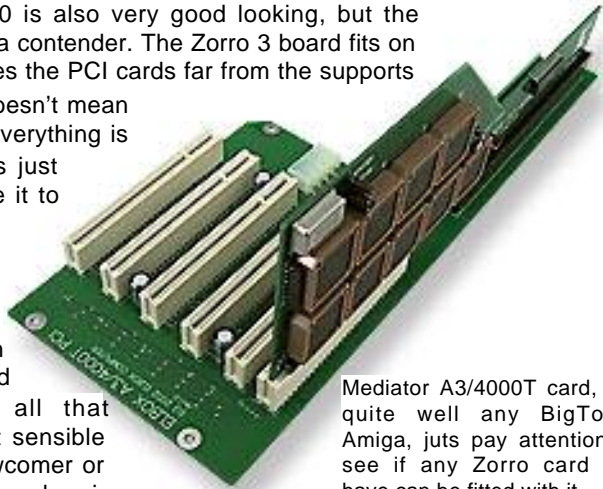
The G-REX 4000D card, fits perfectly on Every 4000, petty it needs a Blizzard PPC.



this field the G-REX 4000 is also very good looking, but the Prometheus isn't much of a contender. The Zorro 3 board fits on the Zorro 3 slots and leaves the PCI cards far from the supports on the box, though that doesn't mean that it's badly designed. Everything is well bolted into place, it's just not as tidy as i would like it to be.

## Finally

Whichever PCI solution you choose, and remember they're not all that different, PCI is the most sensible solution for an Amiga newcomer or an old Amiga veteran who is building an Amiga from scratch. Getting a PCI solution, a PCI Graphics card and a PCI network card is cheaper and easier than buying their Zorro Counterparts, especially if you choose a sound card too.



Mediator A3/4000T card, fits quite well any BigTower Amiga, juts pay attention to see if any Zorro card you have can be fitted with it.

Resources:

The Big Book of Amiga Hardware : [WWW.AMIGAHARDWARE.COM](http://WWW.AMIGAHARDWARE.COM)

This great reference will tell you more than you need to know about amiga Hardware

Due to space reasons we could not cover the 1200 in this issue, it's promised that we will cover its expansion next month.

*Jorge Canelhas*  
16 March 2002



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# Driving your Spectrum

## R Tape Loading error

Sound Familiar ? Quite annoying no ?, What about waiting 5 minutes for a game to load ? Well today that's all in the past. There are plenty of Disk Drives available for the Spectrum computer, it's just a matter of choosing one and - in most cases - finding one available.



Using tapes to load games is just something we don't need to put up with any more. I believe no-one today should bear the pain of loading a taped game. Disk drives are here and there are plenty of choices: the problem is finding them! From this test only one is still sold to the public; all others you must strive to find them either in 2nd hand shops or in auctions (notice that some are pretty hard to find even on auctions).

Retro Review has decided to give you help in choosing the drive that meets your needs! We are going to pick some drives and compare them in terms of features and speed. Most drives here are not more than interfaces that

Doesn't this Speccy look lonely ? Bet he'd look much happier with a Disk Drive on him

connect to a drive itself, but what counts is the whole bundle: there is no point in reviewing the microdrive and overlooking the famous and useful Interface One.

Hope this article helps!

## The Contenders:

**ZX Microdrive & Interface 1** : The original system by Sinclair.

**The DISCiPLE** : Disk, Network, Joystick and Printer interface.

**PLUS D** : Disk and Printer Interface.

**Wafadrive** : Looped tape interface.

**MB02** : Modern Tech for Disk Drive systems on the Spectrum.

## How the test works:

All Interfaces/Drives will be tested against their performance, features and availability/price. Of course most are not on level ground for competition, that will be taken in account. Software support as well as dealer's (if any) support will be taken into account as well.

**Capacity:** The larger the better! Notice that some interfaces allow several types of drive: in this case we will use the most common.

**Format Time:**How Long it takes to get your disk ready for use.

**Format Ratio:**The relative speed of formatting. A larger disk usually takes longer to format, but that doesn't mean the drive is slower.

**Save test:**We simply saved a 16KB file and waited to see how long it took.

**Load Test:**We reloaded the previous file.

**Reliability:**Can you depend on this drive or is it better to have more than one backup? You do make backups don't you?

**Design :** Is the drive well-made, both aesthetically and durably?

**Coolness :** Is the drive cool? Cmon, a Microdrive is cooler than a PLUS D. Of course this test doesn't count towards the final rating!

**Features:** The more the better! here we include everything you get beyond the simple drive interface.

**Final Score:**The name says it all.

Capacity	Around 80KB
Format Time	33 Seconds
Format Ratio	3.03 KB/Sec.
Save Test	10 Seconds
Load Test	6 Seconds
Reliability	5
Design	8
Coolness	10
Extra Features	: Serial Port, Network Port.

**The Score 60%**

# ZX Microdrive

Sinclair's very own mass storage system, and most probably a lot of Speccy users youth dream... who did not want to own a microdrive?

Please note that the Sinclair Microdrive is not really a disk drive but a looped tape drive: the concept is quite simple, you pick a large piece of tape, glue the ends together, place it on a cartridge and you are rolling! No need to press play, rewind and so on. So whats the catch? Well, it's still tape, and reliability isn't its stongest point! The Sinclair Microdrives were used in two different ranges of computers: the ZX Spectrum and the Sinclair QL and clones (ICL "One Per Desk" for example). Surprisingly the microdrives were much more reliable on the speccy than on the QL, mainly due to the shorter capacity on the Speccy. Not that the microdrives were different, but the QL saved the data in a different way so you could cram a little more KB of it (word is that it was done so the Psion office suite would fit on them).

In terms of construction the Microdrive feels strong and reliable, and so does the Interface1 that it needs to connect to the Spectrum. Besides, I think the Microdrive is the coolest peripheral you can get - it's really cute having one! Plugging the Inetface one also brings a network and a serial port to your Spectrum. Up to 8 microdrives can be connected at once (with only one accessible at a time).

Speed isnt the top feature of the microdrive, in fact nothing in the microdrive is the best (except for the looks!). It's unreliable in the long run (though there are carts of mine with >10

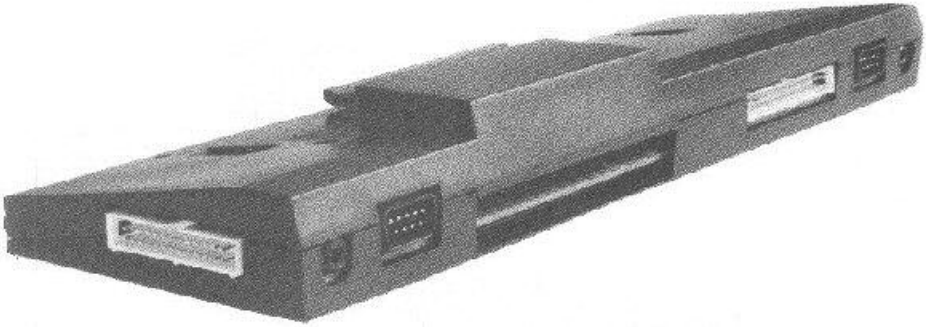


years that still work), it's slow and its capacity is poor. On the other hand they are pretty easy to find and usually cheap - same for the Interface 1. Plus they are supported by Romantic Robot's Multiface and do not 'eat' the Spectrum's memory. On our tests the Microdrive acted less reliably than the other interfaces tested, but the microdrives are old so that can be the main cause.

Capacity	Around 80KB
Format Time	33 Seconds
Format Ratio	3.03 KB/Sec.
Save Test	10 Seconds
Load Test	6 Seconds
Reliability	5
Design	8
Coolness	10
Extra Features	: Serial Port, Network Port.

## The Score 60%

# The DISCIPLE



MGT's masterpiece in many people's opinion, and one of the best ZX Spectrum add-ons you could get - this fantastic interface 'has it all' - these were terms used to describe the Disciple some years ago. The interface is indeed rather good, and it offers some really cool features: it supports almost any kind of disk drive you can think of EXCEPT >780 KB ones (remember the interface is old), it runs MGT DOS and has: Disk drive interface (if it didn't it wouldn't be here!), Printer interface, Joystick Interface, Network Connection, and a snapshot button that allows you to save the games you play - plus it supports 128 KB games too. The design is just great if you have a + machine (i.e. ZX Spectrum + or ZX Spectrum +128): it fits perfectly and bolts on to the ZX. On the downside, if you use a Multiface you must stick it between the Speccy and the Disciple and the set-up won't look so cool. The unit proved to be very reliable and fast - it never had a problem loading or saving the files. MGT DOS also has 'extended' network support in a way that allows you to 'upload' programs to all workstations in

your network. The only thing that it could also have is a serial port, but it can't have it all, can it ?

This interface works fine with the Multiface 128 and with the Interface 1, but to use the latter you must switch the unit off when powering up.

The interface works with all Speccies up to the +2 (the grey one, not the +2A).

Capacity	Up to 780 KB
Format Time	108 Seconds
Format Ratio	7.2 KB/Sec.
Save Test	4 Seconds
Load Test	2 Seconds
Reliability	8
Design	9
Coolness	9
Extra Features	: Parallel Port, Network Port, Joystick Port, Snapshot button

## The Score 90%

# MGT Plus D



There really isn't much to say about the Plus D, besides being a best seller drive interface for the Spectrum. It is in reality a cheap version of the Disciple: its features are cut down from the Disciple, and there is only a Printer Port and a Parallel port on this unit. The snapshot button is still there though and it features a LED too. Design is minimalist, it's really just a metal box around a PCB, hung behind your Spectrum cluttering up your desk. The unit works fine with the Multiface 128, but it won't work with the Interface 1 as there is NO on/off switch. Network is gone, and so are the Joystick interfaces and the pass through port.

This unit is as reliable as the Disciple, and it uses a newer version of DOS. It's also very compatible: most programs will work fine without modification. This unit works with all Spectrum models up

to the +2, but there is a hack to make it work with the +2A on [www.papaya.org](http://www.papaya.org).

Capacity	Up to 780 KB
Format Time	108 Seconds
Format Ratio	7.2 KB/Sec.
Save Test	4 Seconds
Load Test	2 Seconds
Reliability	8
Design	5
Coolness	5
Extra Features	: Parallel Port, Snapshot button

## The Score 75%



# Wafadrive

The Rotronics Wafadrive is a curious beast, to say the least, and stands out from the rest both in its shortcomings and its strengths. The biggest flaw in it has to be the memory management: it takes up the highest 2K of your Speccy's RAM just to load in its operating system! Of course this makes saving games out to wafadrive tricky to say the least, as most games don't fit in memory any more. There is a good side effect to this, though - the OS is nice and easy to use! No nonsense with LOAD `**m";1;"chaos"` like on Interface 1s, just type NEW \* to activate the OS (and load itself into the top 2K) and then LOAD \* to load the first file on the first drive. Loading a file from the second drive (each Wafadrive has 2 units) is just a matter of LOAD `**B:Chaos"`. Could it be any simpler? Yes, but only by emulating the tape. So ease of use is a definite strength. However, things start to look a bit less rosey from here on in. The biggest problem for modern Speccy owners is compatibility - they don't work with any machine with more than 48K! Also Timex 2048s don't work with it, so it really is quite fussy. Plus the fact that most games don't work with it either because of the RAM used up, and it's only really useful on old games and your own programs.

It also has the disadvantage of being tape drive. Many of the wafas around today just won't work any more as the tape has decayed (it's just a very thin loop of tape like that used in VCRs - audio tape doesn't hold enough data reliably), and that's assuming you can find any in the first place. Plus many of the wafas are only 16K in size (they also come in 64K and 128K) which doesn't hold very much at all, but at least they're



quick compared to 128K wafas which take forever.

There's really no place for tape drives now disks are cheap, but they're still kind of cool. Just don't expect them to be too useful! Incidentally, the serial and parallel ports are non-standard so terribly useful either. Incidentally, those times below belie the speed of the tapes -95% of the time is seek time, so loading 48K takes little longer than 16K. Also the formatting makes 3 passes and is very thorough - hence the time.

Capacity	Around 80KB
Format Time	165 Seconds
Format Ratio	1.5 KB/Sec.
Save Test	~35 Seconds
Load Test	~35 Seconds
Reliability	4
Design	8
Coolness	6
Extra Features	: Serial Port, Parallel Port.

## The Score 50%

# The MB02

## ATTENTION:

Retro Review HAS NOT tried this product ourselves, all the data was provided by Sintech, so we can NOT make sure the results are correct. On the other hand Thomas Eberle is an honest person so there is no reason to doubt anything on his part.

See <http://www.sintech-shop.de> for more details on this interface.

The MB02 is the most famous product that Sintech distributes (apart from the speccy and other brand machines). It's the latest of the ZX Spectrum interfaces, and it uses current technology on the ZX Spectrum. This interface features (quoting Sintech site):

Floppy disk space: HD 1.86 MB, DD 840 KB, speed: HD: 40-50 KB/Sec., DD 25 KB/Sec., Internal Memory: EPROM 2K (max. 64K), SRAM 128K (max.512K), a first rate DOS - a tape-compatible system (that is a great advantage!), up to 256 sub-directories on one disk, built in DMA-chip available with DOS-supported real time clock, built in Kempston-joystick interface and 3-channel bi-directional parallel port.

In terms of design, I really hate that big box standing out from the back of the spectrum, but otherwise it looks very resistant.

Another point in favour of the MB02 is that it's still being distributed, so its much easier to get than most of the



interfaces reviewed here. I really believe that for its price this product is a great addition to anybody's beloved ZX Spectrum!

Please check out Sintechs web site to find out more, and feel free to mail Thomas with any doubt; he is a really helpful person (Also check the Thomas Eberle interview in last issue!)

Capacity	1.86 KB
Format Time	- Seconds
Format Ratio	- KB/Sec.
Save Test	- Seconds
Load Test	- Seconds
Reliability	-
Design	5
Coolness	9
Extra Features	: too many to fit here.

**The Score 95%★**

# Which one to choose ?



Now for this, the most difficult part. Our recommendation goes of course to the MB02, which is the most modern drive system you can get, but since money does matter, we will leave you a couple of guidelines so you can choose for yourself:

- 1) Avoid Looped Tape drives: These do look cute but where will you find the cartridges when you need more ? Besides, looped tape isn't as reliable as a floppy, and if the glue decays on the tape, you're left with a non-looped tape (and a useless cartridge!)
- 2) Check the drive most of your friends have. Drives are really more than a storage medium: a floppy drive is also a means of distribution - if all your friends have a Plus D and there is nothing on any other model that you really can't live without then stick with the masses and buy one like your friends.
- 3) Look for Extra Features : As I said, the more the better! Most interfaces don't have a through-port so its better to have everything in one piece.

Jorge Canelhas

## Connecting your ATARI to the PC



Browsing through the web, I stumbled again on something that caught my attention some time ago: the SIO2PC. What's the SIO2PC you ask? There is no better explanation than this excerpt from the [comp.sys.atari.8bit FAQ](#) :

Quoting... ‘

Subject: 11.5) What is SIO2PC?

Original text by Dave Paterson, <mailto:davepat@total.net>

SIO2PC is a cable and software combination that lets you use your PC as up to 4 drives for your 8-bit. Drives can be SD, ED, DD or custom sizes up to 16 megs. SIO2PC also lets you redirect the printer output to your PC printer or to a file on the PC. High speed drives are emulated (a la US Doubler). All these functions are transparent at the Atari end; you never

notice the difference between SIO2PC and regular drives, except that the SIO2PC drives are faster than any others (except Ramdisks and PBI interface drives). Several different designs for the SIO2PC hardware are floating around. Best contact the author for the latest details.

SIO2PC 4.16 is shareware by Nick Kennedy, [mailto:nkennedy@cswnet.com](mailto:mailto:nkennedy@cswnet.com)

‘ end quote

Quite interesting dont you agree? especially when you consider the average price for XF551 Floppy Drives (that go for an average \$150 USD) or the not so costly 1050 Disk Drives (that can reach \$100 USD for a AS IS unit - read AS IS as a “not sure it works”, or worse I've tried it but it didn't boot'). The cable is quite simple to use, just plug one end to your Atari and the other end to a free serial port in your PC; run the

PC software and you are rolling! The unit I got was tested on 3 models of Atari computers, the old ATARI 800, a 65 XE and a 130XE, it worked OK on all 3 models, which makes it safe to say it probably will do so on all other 8 bit models. I haven't had the chance to test it together with other peripherals, but a scan of some message boards alerted me to some troubles and some posts from people who just couldn't get anywhere at all.

## Disk Images are kept in the form of ATR files

Atari disks are kept on the PC on the form of ATR disk images. These can be downloaded from the 'net, created with the software (Empty images) or made with 10502PC software and cable (this cable allows you to connect an ATARI 1050 Disk Drive to your PC).

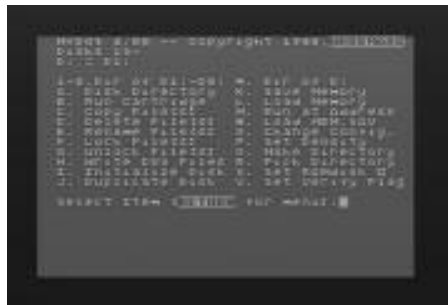
We tested 2 software packages for the SIO2PC cable: first is SIO2PC software by Nick Kennedy - check his webpage at [www.cswnet.com/~nkennedy](http://www.cswnet.com/~nkennedy), he is also the inventor of the most popular 2 chip design of the SIO2PC cable, but there are many simpler yet similar designs. SIO2PC is a DOS program that refused to work in my Windows 2000 workstation, but it has all the bells and whistles you can think of and it's fast enough for all that you can do with it. Also it does not require much ram or

On the Right

Two of the Lucky ATARI computers used for the SIO2PC cable test, some soft loaded ok on the 800 but could not be loaded on the 130XE; most probably a compatability problem.



The Atari 810 Emulator, good looks but not so stable as we wish. It works fine on Windows 2000 though.



My DOS ATR image after loading on my ATARI 800, it did not load on the 130XE.



```

C:\DOCUME~1\ADMINI~1\Desktop\sio2pc\sio419\SIO2PC.COM
SIO2PC 4.19i: An Atari to PC Interface System

C - CREATE ATARI DISK IMAGE
L - LOAD DISK IMAGE FROM FILE
S - SET PORT NUMBER: 2
H - EXIT TO DOS SHELL
K - LOCK DATA LINE: < AUTO >
D - DISPLAY DIRECTORY
U - UNINSTALL DISK
A - ALTER BUS TIMING VALUES

I - INSTALL PC FILE AS DISK
W - WRITE DISK IMAGE TO FILE
T - TOGGLE STATUS LINE
X - EXCHANGE DISK I.D. NUMBERS
P - PRINT THRU:
E - ENTER HEX ADDRESS: 02F8
J - JUMP TO ULTRA SPEED <TOGGLE>
Q - QUIT PROGRAM

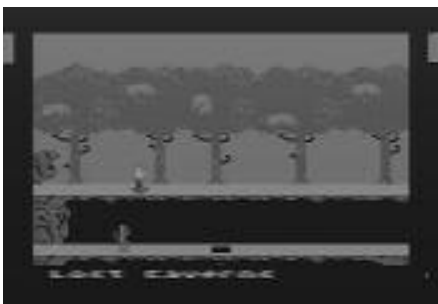
DISK 1: 90K: SD, N, C:\DOCUME~1\ADMINI~1\DESKTOP\SIO2PC\SIO419\ATARI.ATR
DISK
DISK
DISK

Disk Emulator is running.

HDL: 5 CMND: LAST: DEU: COM: 0 ERR: ~ SEC#: 0000 RAM: 479K SPEED: 0
  
```

The SIO2PC Software. Doesn't have the great looks of Atari 810 software but it does the work on any humble machine. You can download the latest version from <http://www.cswnet.com/~nkennedy>.

processor speed so a 386 with dos 6.2 would be a great replacement for a 1050 disk drive - and I bet you can find one cheaper than a disk drive.



Blue Max and Pitfall, 2 atari classics loaded with SIO2PC Cable

Atari810 software: this piece of software made in Visual Basic has a very cool GUI that will warp you back to the time when you used an 810 disk drive. The program allows you to mount up to 8 disk images and supports harddisks of 16 MB. Also this program will work on Windows 2000 with no problem. The only catch I found was the stability of the software that sometimes hangs without any explanation, but it's perfectly bearable and it doesn't happen that often. The software also allows you to create ATR disk images, all menu driven and you can save your disk sessions to a XML file. This will allow you to track all that disk swapping and stuff. The best thing about this program and the SIO2PC program is the price, which is free! Now really it would be still a great purchase if it costed money. This program can be downloaded from <http://www.bitsofthepast.com/atari>.

The speed of both programs is similar,

blue MAX took almost 30 seconds to load on my 130 XE or 800. Smaller programs will be faster of course: it beats the 1050 Floppy drive with no problem. Also the ability to use the PC as a massive archive is just too great, not only for space reasons but I believe that most of Atari 8 bit Magnetic media is reaching the end of its lifespan.

## The SIO2PC cable

Originally designed by Nick Kennedy, the SIO2PC cable can be found in numerous forms now. From what I've read in many places the original is the best: there are 2 ways to get the cable, 1st is the Do It Yourself way, just go to

Nicks Page and grab the schematic (isn't this guy great? not only does he make great software but he also provides the cable schematics) or buy it from someone over the 'net; just do a search on Altavista and you'll find plenty of sources for the cable.



### **SIO 2 PC Cable**

Great tool, easy to use, nothing bad to stick on it, an absolute winner.

**100 %**

### **SIO 2 PC Software**

Works good, fast and reliable, pity the fact that it won't work on Windows 2000 (At least on mine)

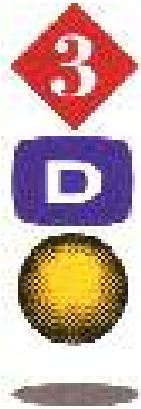
**90 %**

### **Atari 810 Software**

Good Looks, plenty of features (Not as many as Sio2PC), heavy requirements though.

**80 %**





**R·E·A·L™**  
3DO™ INTERACTIVE MULTIPLAYER™

# RETRO Gaming?

At the tail end of what we at *Retro Review* call the Retro 'era', there was a new CD-based console released - even before the Amiga CD32. *Ian Gledhill* has a look at the machine often forgotten by retrogamers - is it worth finding one for a retro collection?

When 3DO (the company) decided the specifications of the new 3DO console, it was hoped many would-be console manufacturers would jump on board, making the new console a competitive, powerful and yet cheap console... and indeed at one time it was looking hopeful for the new machine. With large companies like Goldstar and particularly Panasonic supporting the 3DO, it couldn't lose, right? And with games like the very desirable *Wing Commander* series throwing 3D polygons around the screen, the large "R-E-A-L" plastered on top of the consoles was looking less and less like a case of all-hype-no-substance. Remember, this was 1993. The ill-fated Sega Saturn was yet to appear, although rumours of the all-Japanese console were abound with tales of the sheer power of its dual-CPU 3D architecture. Commodore were about to release the CD32 (based on the popular Amiga A1200). Sony were apparently working on a new killer console too. These were interesting

days to be a small fish in a big pond, which compared to the competition 3DO most definitely were. However, all these other machines were just that - rumours.

3DO had realised that there was no way they could compete with the might of the Japanese manufacturers - so why not join with them? In December 1993 Panasonic produced the 3DO FZ-I, sporting a 12MHz ARM 60 CPU, as well as another few graphics processors for good measure. Not only that, it used the new CD-ROM media. But what was it really like at doing what it designed

## ***Not only that, it used the new "CD-ROM" media***

for... *playing games?*

Software support initially was good - Psygnosis brought out *Lemmings* (always a good start for a title at that time!), E.A. were producing ports from current PC/Amiga titles like *Theme Park*, and Panasonic themselves were making

versions of games like Street Fighter II Turbo. Perhaps most important, though, were the new all-singing, all-dancing 3D games (the name Wing Commander springs to mind immediately) - texture mapped polygons flying around exploding smoothly was a new phenomenon, and the new games showed off the machine admirably. Full Dolby Surround sound would blare out of the Hi-Fi (if you could afford a 3DO



*No lack of colours or animation here...*

you probably had a stereo system!) and you'd actually feel part of the action. Almost. The 3D hardware was powerful, no doubt about that - but somehow, it still feels somewhat artificial. The frame rates aren't too good these days, compared to modern consoles, but for the day were excellent. However, a low frame rate will still make the game feel like just that - a game. Possibly because of this, many of the games avoided the full-on 3D effect as used by games like Wing Commander and Total Eclipse, preferring instead to use 3D as a vehicle for the gameplay. It's these games that make the 3DO special. It's unfortunate there's not many of them!

There was just one tiny problem. One ever-so-small hitch that dogs console manufacturers to this day (can you hear this, Sony?) - programming the thing. Not that you'd know it if you were playing the console, but the sheer unmitigated pain of trying to get all the processors to do the right thing at the right time is a legend among coders. It was likely for this reason more than anything that the 3DO and the Saturn fell before the mighty - and comparatively simple - PlayStation. It might also explain the relative lack of true 3D games for the console. Perhaps if Doom had in fact come out early enough (it was close to finish in 1996, but was never released), the 3DO would be the console to beat these days.

## **Two-D or not Two-D?**

Perhaps the best way to look at the gaming potential of the 3DO console is to look at 3 different games, each in a very different style.

The 2D....

Street Fighter 2 Turbo is one of the last of the 2D beat-em-ups - and very popular, particularly on the Nintendos of the day. So could 3DO take them on?

### ***The framerate aren't too good these days....***

The answer has to be, in a word, yes. Looking at the animation, all running at 50 frames per second (although unfortunately lacking in animation frames like every other version), with parallax and many colours on screen, it's hard to imagine that port is anything other than an accurate one.

The 2.5D....

2.5D (two-and-a-half-D) is a term usually used to describe games that aren't quite 3D, but appear more or less



*Meet pumpkin. He's level 25 and he doesn't like the look of that mermaid. Looks like there's going to be trouble....*

3D. Doom is a prime example (as compared to Quake, which was 3D). As my example, though, I'll choose a game called "Powers Kingdom". Hands up all non-3DO owners who've heard of this game. The complete lack of response reflects the unfairness of the industry! Panasonic (for it was they that programmed it) used a full 3D engine for the landscape but used bitmaps for the sprites! On top of that, the maps are clearly created in a simple 2D way, but with 3D graphics for each tile. It sounds complicated - and it is. But it works. The 3DO's hardware is plenty powerful enough to rotate and zoom enough polygons to make the game atmospheric and involving. The actual game is very simple - imagine Final Fantasy but with just the fighting bits. Pick up powerups, change your players strengths and weaknesses and conquer the bad guy! It all makes a very playable game which suits the 3DO down to the ground.

Now onto the 3D... It has to be Wing Commander III.

It has to be said that the 3D element of the game is less than as impressive as it used to be. The size of the display that is actually 3D is rather small, and there is little in the way of smooth animation. True, it's competent enough to hold the game together, but it's just not *impressive* any more! Whereas games like Theme Park and the above Powers Kingdom hide their age very well, the 3D games on the 3DO tend to do just the opposite. Of course, in much the same way as the modern PS1 games are much more impressive than the original '95 efforts, it's more than likely more could be done with the hardware, given time to get to know it properly. However, this just was not the case, and not only did people not know then, but it appears nobody is trying to learn more tricks to eke more out of the chips. That's not to say Wing Commander is or is not a fine game - but what it is, is less impressive now than perhaps the other 2D/2.5D games are even today.

***It makes a very playable game - which suits the 3DO down to the ground...***

From a retro-gaming point of view, however, the 3DO offers potential. Putting aside the games that are ports of PC games, for a moment, there are still some fine games in their own right. Powers Kingdom (or "Guardian Wars" in the US) is a fine example of where 3D can be used to complement playability rather than ruin it. Not only that, but the horribly difficult "Slayer" from SSL (yes, it's an AD&D game!)

has been nominated as people's favourite game before now. And even remembering the PC ports - how many



*Perhaps I shouldn't be targetting my mate.  
Oh well, it's all in good fun...*

machines these days can run games like Theme Park easily? I've not tried but I can't imagine Windows XP enjoying the attempt. In this way, the 3DO is definitely a good console for people who like their games pretty and involving. If you're a die-hard Atari 2600 freak, you're unlikely to find too much to interest you. However, if you like simple action games or sim games with an element of 3D rather than 3D engines with an element of gameplay, you can do a lot worse than a 3DO.

The only fly in the ointment is emulation - there isn't any! Looking on the web for 3DO emulation brings up a

number of sites mentioning the machine, but with no emulator! Therefore if you know of an emulator for the 3DO, please let us know! In the meantime, the only way to play these games is to find a second hand 3DO. They're not very hard to find, but they're scarce enough. Check out our eBay price guide at the end of the mag for more prices of 3DO consoles.

Next up is a review of perhaps the most common 3DO - the Panasonic FZ-!!

### **Wot no Emulators?**

OK, saying there are no emulators is only 95% accurate. Nip off to <http://freedo.sourceforge.net> and you'll find an open source effort to emulate the 3DO. The only problem is there doesn't seem to be exactly a lot happening there. It seems that Allen Wright has created the project, and is making some progress on his own. He hasn't actually released any files, yet, but he seems to be learning the ARM processor before going any further - a wise idea, in my eyes.

So who knows, maybe in a year or so FreeDO will be released and the unemulatable will be emulated (they said you couldn't emulate the Amiga... until someone did it!) Best of luck, Allen!

### **Important 3DO sites...**

The all important FAQ is at

[http://www.essi.fr/~buffa/videogames/3do\\_faq2.4.html](http://www.essi.fr/~buffa/videogames/3do_faq2.4.html)

some of it is a little out of date (like the bit that says the FZ-1 is the only 3DO available yet)

Some more history on the 3d0 can be found at

<http://www.videogamers.com/editorials/3do-shawn.htm>

and one more site dedicated to the machine is at

<http://www.cahudson.freemove.co.uk/>

# *The Premier 3D0 console?* *Here's the* **Panasonic** *entry*

*Panasonic were the first to market their 3D0 console in October 1993 - but does it stand the Test of Time? Ian Gledhill takes a look at the Japanese giant's first 3D0 - the FZ-1.*

Of the few 3D0 consoles that actually were produced, the Panasonic FZ-1 that started it all is arguably one of the best. Of course - that comes at a price: it was also one of - if not *the* - most expensive. \$700 is a lot for a console now, let alone ten years ago. Anyone can look back and say that \$700 was too much - indeed, I'm sure Panasonic *knew* it was too much at the time. But the price tag remained - why? Because of the quality.

Comparing the FZ-1 to other consoles of the day like the Saturn and the CD-32 (and even other 3D0s that came out subsequently), the first thing you'll notice when trying to play a game is the CD drawer. Usually when a console is being designed, cost is a major factor, and so cheap mechanisms like the one on the CD32 are used (and they don't get much cheaper than the CD32's mechanism!), but in the FZ-1 they've used the more expensive tray-loading mechanism as found in modern PCs and consoles. Obviously cost

wasn't the major factor here. And that's not the only indication of cost either. A quick look on the back of the FZ-1 reveals an array of connectors - no generic "AV out" like consoles do these days to cut costs, this baby has the works, composite, RF, even SVideo, plus the obligatory audio connectors (phono plugs like the Amiga of course - this machine was always meant to be connected to high end audio equipment).

Even the controllers feel nice and sturdy, and because of the forethought gone into the 3D0 standard, each controller comes with not just the usual buttons, but also a headphone jack, volume control and a joystick port - this way the console could be connected to up to 8 controllers without the need for any extra hardware at all, as each controller daisy-chains to the previous one. Why don't modern console manufacturers do this? After all, it's much better to have just one controller lead winding across the floor, right?

True, but extra hardware for connecting more controllers means more money from selling the hardware....

So enough of the physical characteristics - what's the component quality like? Generally speaking, excellent. The FZ-1 gives a clear



*The FZ-1 in all its glory. Note only one Joypad connector...*

picture and audio. Even connected to a Win/TV card the picture quality is fine (and TV cards like in my PC are surrounded by interference so the picture signal has to be strong). In fact, given all this there is a surprising problem with the CD-player. The software all works fine, yes - the analysers and graphical displays all

dance away merrily, it plays the right tracks at the right time.... but it plays them *too fast!* For some reason best known to Panasonic, the CD actually seems to spin about 5% faster than it should do - not only is the music higher pitched, but the timer on the console also goes too fast (remember that CDs hold timing information on them). Why this is the case is beyond me - does this happen on other 3D0s?

So would we recommend the Panasonic FZ-1 as a console? Definitely. Although you can't get hardware for it any more, you don't need any. Even the NV-RAM is big enough to store a number of games (are you reading this, CD32 designers?). There's no need for external AV connectors as this machine has the lot. And best of all because the machines went down in price at the end of the 3D0's life, they're not expensive to buy on auction sites. They're not common, but they're not rare either.

All in all, a good console with some fine games. Check it out!

*Ian Gledhill*

### **Games on the FZ-1... (or any other 3D0 for that matter!)**

Got a fast connection? Here's a link that'll tell you where to download ISOs of 3D0 games. I imagine they're not all legal, though so please if you like a game at least try and get a copy on eBay.

[http://thecodeman.d2g.com/scripts/cgibin3do/ultimatebb.cgi?ubb=get\\_topic&f=1&t=000020](http://thecodeman.d2g.com/scripts/cgibin3do/ultimatebb.cgi?ubb=get_topic&f=1&t=000020)

There was a site with reviews of all the 3D0 games at

<http://binky.paragon.co.uk/reviews/3DO.html>

but it doesn't seem to be up at the moment. Nonetheless, maybe it will return.

Given the sheer speed of today's personal computers, emulating an old 8-bit machine from 1982 will be no problem - the emulation will be perfect as there's so much horsepower to cope with the hardware. Or so you'd think - and indeed on the simpler machines like the Sinclairs it's true.. but it's a different story when the custom-chip based machines like the Commodore 64 are considered.

comes in UNIX flavours).

### ***Introducing the Contenders***

Per Håkan Sundell's CCS64 is generally held to be the most accurate of the emulators, at the expense of requiring a higher-end computer to run properly than the competition. Of course, "higher-end" when CCS64 was started in 1995

## ***Emulation: the Sincerest form of***



## ***Flattery?***

***What better use for a modern PC than running 15 year old 8-bit games? Well, plenty of uses according to most people, but Ian Gledhill would beg to differ....***

An emulation should be indistinguishable from the original machine, ideally, otherwise at least some of the original feel of the software will be lost. To try and find the most accurate C64 emulator out there, we'll consider the three that are most commonly used on PCs: CCS64 (Windows), C64S (DOS) and WinVICE (Windows). Obviously there are many more emulators than that out there, but these three appear to be most commonly used on Wintel machines (on other machines Christian Bauer's Frodo is often used too, although VICE also

meant a Pentium, so a modern ultra-low-end machine is easily capable of running it these days. In fact the emulator was apparently made as a thesis project for his Masters at University - I'll bet he spent more time than most "testing" his project...!

Next up is Miha Peternel's contribution: C64S. In fact this emulator hasn't been updated much recently - the latest news on his webpage is from May 2001, and the latest version is dated from the end of 1997. However, if it ain't broke, don't fix it...



Third and finally is *WinVICE*. This is definitely the odd one out in as much as it doesn't only emulate the C64, but others in the family too, from the PET to the C128. It also has the definite advantage of being completely free!

## Interface Issues

As might be expected of a DOS application, both CCS64 and C64S are a little lacking in fancy GUI features. There are, however, frontends for both of these emulators, such as *GameBase* and its predecessor *GameBase64*. In terms of ease of use, however, WinVICE certainly gets the thumbs up as everything is available from the menus as in any other Windows app. Front ends can help matters but *GameBase* in particular is so versatile (read: complex) that it actually is harder to use for a beginner than the emulator itself! Any options in the two DOS-based emulators (CCS64 has a Windows version identical to the DOS version) are chosen by pressing F9 and then navigating through some rather basic (but ample) menus - fine for someone who knows how DOS works but I'd hate to see

someone inexperienced try with it. At least they all configured themselves correctly, though - the only drawback for CCS64 being that it couldn't find a good screenmode and so forced itself to use 640x480, with the C64 display a small rectangle in the centre of the screen. A quick visit to the options menu changed this without hassle, though. In terms of the user interface, WinVICE would definitely be the one I'd use for a beginner. CCS64 would be next, along with C64S, both of which being functional but competent.

```

          CCS64 02.0 BETA
          (C) 2002 Per Hakan Sundell
-----
1541 Device 8...      Alt+B
1541 Device 9...      Alt+S
1541 Device 10...     Alt+D
1541 Device 11...    Alt++
Tape Device 1...     Alt+I
Printer Dev. 4-7...
Cartridge...         Alt+C
Special...           Alt+E
GameBase...          Alt+I
Machine code monitor
Reset C64            Alt+R
Options...           Alt+O
Quit CCS64           Alt+F4
Continue
-----
Fi=Action

```

*The oh-so-friendly DOS based front-end of CCS64. Simple but effective (but not for the faint of heart)*

## Compatibility concerns

The most important facet of any

### So why use an emulator anyway?

#### Pro's

- Only one monitor, keyboard, etc!
- One hard disk holds HOW many floppies?
- No mass of wires for each computer you use!
- No need for a cup of tea while the 1541 sloooowly loads a disk!

#### Con's

- But the graphics are never *quite* right...
- And there's nothing quite like genuine original SID music through a stereo!
- Get that authentic 8-bit feel instead of that characterless PC keyboard
- The nostalgia! And satisfaction of doing something so cool on 80s hardware!

emulator is how much it runs - something advocates of CCS64 are particularly proud of, and with good reason. Nothing I have been able to throw at it has stopped it working - C64S has also proved itself quite reliable, taking any games I cared to mention, although it did struggle on the excellent Royal Arte demo. However, WinVICE did not fare quite so well. In fact the very first disk I gave it to chew on, it failed to load the game I wanted. It loaded the next few things, but giving it Uridium (now there's a name that strikes fear into the hearts of emulator coders everywhere) made it baulk before the intro. Of course that means the fault probably lies with the crackers (unfortunately most of the Arnold archive has to be cracked versions otherwise they'd be copy protected) rather than the guys at Graftgold, but nonetheless it doesn't bode well for people delving into C64 games at random. Incidentally, WinVICE loaded the first part of the Royal Arte demo, but failed to load the second.

## Graphical Glitches

The primary strength of CCS64 - they say - is the emulation of the custom chips. They boldly say they emulate all the workings to the finest detail - and indeed it pays off. It is clear that the emulation of the hardware is almost



*Good old scrolly text - but it only really looks its best on the real machine...*

cycle exact - but not quite there yet. While most of the time absolute accuracy isn't important, (for instance, an extra few pixels at the side of the screen of a particular colour, like the

### **Are you sure *this is 50 frames per second?***

On all the demos and large-sprite based games I tried, it was noticeable that the real C64 was far and away smoother at animating the sprites than any of the emulators, even CCS64. Some of this was probably due to the scanrate of the monitor being out of sync with the C64 and its 50Hz display, but at other times the movement was distinctly jerky: this shouldn't happen with an emulator that's running to the same frame rate as the original: the two should be identical! Therefore we can only assume that either the emulator is *not* running at the 50 frames per second it says, or else the Vic emulation is only approximate when moving large objects at speed. There should be no stuttering at all- some tearing from the scanrate, perhaps, but no stuttering, yet try any emulator with a demo like Royal Arte and put a real '64 next to it. The difference is noticeable to say the least.

intro to Uridium) it can lead to more serious problems if the emulation isn't quite right, and it's probably here rather than the CPU emulation that WinVICE and to a lesser extent C64S suffer.



*Those galleons have no heavy cannon doors which give a good, solid thunk when opened or closed... but only on a REAL C64!*

Under C64S, for instance, the title screen of Uridium has an extraneous line of dots above the main window - a minor fault, but perhaps related to why some programs like the Royal Arte demo don't work? It has to be said, though, in the graphics department, CCS64 is the clear winner.

## **Sonic Booms....**

Of course the C64 is more than just a graphics engine. Check out the amount of SID tunes around on the 'net for an example of how well used the C64's sound chip was. Sound is notoriously difficult to emulate well at the best of times, though, and it shows. Not one of the emulators managed to do the SID

justice. As a test bed, I used *Piracy* from Ace; when the pirate ship doors open, the C64 gives a satisfying "whump". However, the closest I could get out of any of the emulators was a vague crackle at best. CCS64 once again gave the best effort, though - at least the music played well. C64S tried but couldn't get the volume right, so the music sounded all wrong. WinVICE couldn't load the game at all. The other sound test was again the Royal Arte demo.... on the C64, the tune plays with a heavy beat and they've managed to get a good drum beat going. However, CCS64 and WinVICE both managed little more than a vague "phut". C64S failed to load the demo at all - it couldn't cope with the turbo loader. So when it comes to sound, CCS64 is the best of an iffy bunch. It's true that sound is fiendishly difficult, though, and to get it sounding right most of the time (which they all do) is still quite some feat - they just have some way to go yet.

## **So which way to go?**

As a true perfectionist when it comes to emulation, it's got to be CCS64. C64S has niggling little features (such as the "Nuke-your-system key" which is supposed to go into the machine code monitor, but which Windows 98 doesn't like at all and reboots at), but is competent enough. If something didn't run on CCS64, this'd be my next port of call. Looks like the 1541 emulation needs a bit of work, though. WinVICE is nice to use - if someone wants an emulator who's not too techn-savvy, this

is easily the best option. Pressing F9 to bring up options isn't the simplest thing to remember unless you recall that a real C64 only has 8 function keys! The menus are very straight forward, easy to use and don't befuddle the user.

If you want the closest thing you can get to a C64 on a PC, though, CCS64 has to be the choice. True, it's not perfect: some stray pixels here and there, and the palette isn't right (but can be changed), but the compatibility makes it worthwhile.

Of course, if someone asks me what I recommend? I'd say a real C64! Commodore emulation is getting better all the time, but it's not there yet: at least not without hardware. Some emulators can use SID cards, but then you might as well just use a C64 (you could even use a WinTV card for the display). So my advice: buy a C64 (they are *stupidly* cheap on eBay - I just bought a backup one for a fiver), connect it up to a good stereo, download some demos and

enjoy what people are still today doing with their 1MHz babies.

### Does it *have* to be a 64 though?

Perhaps one important "emulator" has been missed out... that of the CBM 128. These days the C64 isn't the only cheap Commodore, if you're willing to pay the shipping, or come from Australia, you can pick up a C128D quite easily, which includes the 1571 and the seperated PC-style keyboard. Why Australia? For some reason they come up quite often down there, and sell for lower prices than US-spec ones. I have yet to see one in the UK at all! If you can't get the 128D model, the normal 128 is also a good buy if you can find one, but they're a lot scarcer than 64's.

### Essential links...

[www.c64.org](http://www.c64.org)  
[www.c64.com](http://www.c64.com)

[www.c64.sk](http://www.c64.sk)

[www.commodorescene.org.uk](http://www.commodorescene.org.uk)

[www.computerbrains.com](http://www.computerbrains.com)  
<ftp://arnold.c64.org>

The scene starts here...

Games, games and more games. Plus a few games. It's basically the games section of [c64.org](http://c64.org)

A portal dedicated to all things 64. Regular updates and links anything currently going on in the 64 world.

Home of the dedicated Commodore mag.

Get your CCS64 emulator here!

A massive archive of disk images of all kinds! Check out [/pub/games/blast](#) for a great collection of games.

# Auction Review

Once again eBay has been filled with weird and wonderful machines being sold at sometimes-ludicrous prices. We're now close to the 1,000th machine in our eBay summary, and at this rate we could easily have more than 2,000 machines recorded by the next issue!

Those who read this section last issue will recall a "Sekon" was sold - and nobody knew what it was! In fact, it turned out that it was indeed an Apple ][ clone from the States. This time, however, we have seen a new record in prices recorded by Retro Review - one lucky man bought an Exidy Sorceror for the whopping price of 406 UKP (from, it seems, an even luckier man!).

We've also seen some unusual behaviour in more common computers - the Atari 1040STFM which reached 104UKP, for instance. We've also seen a slight increase in the prices of the scarcer Commodores, the C16 and the +4 (note I use the word Scarcer not scarce!), but the Amstrad range is still horrendously underpriced. I mean, a working CPC464 for 1.70UKP?

Now that we have the States recorded we can see just how common (and cheap) TI 99/4As and various Tandy machines are - one boxed TI-99/4A failed to match its reserve price - of 5 US Dollars!

Next issue we hope to have even more machines as more and weirded computers are sold, plus the prices are getting more accurate with every computer on eBay. Who knows what mysterious machines will turn up next issue...?

*Ian Gledhill*

## Computers

	Low	Average	High	Quantity
Acorn A3000	5.00	12.25	21.00	8
Acorn A3010	5.00	29.15	58.90	6
Acorn A3020	5.00	13.44	23.00	8
Acorn A4000	10.50	10.50	10.50	1
Acorn A410/1	21.00	21.00	21.00	1
Acorn BBC B	5.19	24.20	37.00	11
Acorn BBC B+	102.00	102.00	102.00	1
Acorn BBC Master	5.50	45.17	84.00	3
Acorn BBC Master Compact	23.00	23.00	23.00	1
Acorn Electron	5.00	16.09	52.00	13
Apple ][+	36.40	36.75	36.40	2
Apple ][ Europlus	41.00	41.00	41.00	1
Apple ][c	28.00	48.57	82.00	3
Apple ][c+	40.50	40.50	40.50	1
Apple ][e Platinum	60.45	60.45	60.45	1
Apple ][GS	18.50	46.24	73.99	2
Apple Macintosh	42.70	137.04	213.00	4
Apple Macintosh 512K	12.50	20.81	29.12	2

Apple Macintosh Classic	7.35	27.78	51.00	3
Apple Macintosh Portable	35.52	35.52	35.52	1
Apple Macintosh Portable 4/40	142.00	142.00	142.00	1
Apple Macintosh SE	11.00	19.67	27.00	3
Amstrad 464 +	15.00	15.00	15.00	1
Amstrad 6128 +	21.00	30.50	40.00	2
Amstrad CPC 464	1.70	12.23	17.00	11
Amstrad CPC 664	52.36	52.36	52.36	1
Amstrad CPC 6128	6.50	14.38	26.00	4
Amstrad PCW 8256	18.86	18.86	18.86	1
Amstrad PPC512	15.00	15.00	15.00	1
Atari 520ST	17.00	17.00	17.00	1
Atari 520STFM	11.00	14.90	23.00	5
Atari 1040STE	25.67	68.77	78.75	4
Atari 1040STF	10.50	31.71	71.75	6
Atari 1040STFM	10.85	112.85	102.00	2
Atari 65XE	5.00	17.30	40.10	7
Atari 130XE	11.50	18.83	18.20	5
Atari 400	8.41	8.41	8.41	1
Atari 800	41.00	58.18	160.00	5
Atari 800XL	10.50	22.92	60.00	12
Atari 1200XL	59.00	64.00	69.00	2
Atari MegaST 2	18.50	14.77	18.50	2
Atari Portfolio	15.00	15.00	15.00	1
Bandai Pippin	79.00	79.00	79.00	1
Coleco Adam	14.00	21.89	37.31	3
Commodore +4	7.35	25.43	56.04	13
Commodore 16	8.50	10.98	15.00	5
Commodore 64	3.00	20.10	76.00	32
Commodore 64C	3.00	15.05	26.00	27
Commodore 128	9.00	25.66	56.00	7
Commodore 128D	12.00	55.52	102.00	3
Commodore Amiga 500	7.00	17.14	37.73	37
Commodore Amiga 500+	10.50	19.34	28.00	12
Commodore Amiga 600	10.00	19.20	41.50	15
Commodore Amiga 1000	18.00	37.71	18.00	4
Commodore Amiga 1200	15.00	34.30	104.65	35
Commodore Amiga 1500	51.00	51.00	51.00	1
Commodore Amiga 2000	28.70	40.84	73.50	5
Commodore Amiga 3000	106.76	124.25	141.74	2
Commodore Amiga 3000T	126.19	126.19	126.19	1
Commodore Amiga 3000UX	200.00	200.00	200.00	1
Commodore Amiga 4000/040	148.95	227.74	308.00	4
Commodore Educator 64	159.26	159.26	159.26	1
Commodore CBM 4032	50.00	50.00	50.00	1
Commodore CBM 8032	72.10	72.10	72.10	2
Commodore KIM-1	97.00	146.00	195.00	2

Commodore PET 2001-8	211.50	275.11	211.50	2
Commodore SuperPET 9000	136.00	136.00	136.00	1
Commodore SX-64	46.89	97.16	184.00	8
Commodore VIC-20	5.25	23.53	66.00	17
Commtron Video Brain	149.61	149.61	149.61	1
Dick Smith System 80	80.12	80.12	80.12	1
Dick Smith VZ200	15.09	15.09	15.09	1
Dick Smith VZ300	26.25	26.25	26.25	1
Digital Rainbow 100	34.97	34.97	34.97	1
Dragon 32	21.00	34.25	62.00	4
Dragon 64	138.00	138.00	138.00	1
EMS M68K	46.00	46.00	46.00	1
Epson HX-20	14.00	23.29	28.00	7
Epson PX-8	14.35	20.57	26.00	2
Epson QX-10	10.50	10.50	10.50	1
Eurocom-1	69.00	69.00	69.00	1
Exidy Sorceror	406.00	406.00	406.00	1
IBM PC jr	25.20	25.20	25.20	1
ICL OPD	200.00	200.00	200.00	1
John Sands Sega SC-3000H	58.60	46.94	58.60	2
JVC HC-7GB	38.00	38.00	38.00	1
KayPro 1	28.70	28.70	28.70	1
KayPro 2	18.00	50.61	106.05	4
KayPro 10	178.50	178.50	178.50	1
Magnavox Odyssey 2	3.49	13.09	28.70	3
Mattel Aquarius	4.89	18.26	27.99	7
Memotech MTX 500	51.00	51.00	51.00	1
NEC PC8201	31.62	31.62	31.62	1
Olivetti Prodest PC128	15.50	15.50	15.50	1
Open University Hektor II	52.00	52.00	52.00	1
Oric 1	36.00	39.00	41.00	3
Oric Atmos	21.00	21.00	21.00	1
Orizon-Micro	82.25	82.25	82.25	1
Osborne 1	36.40	83.20	133.00	3
Osborne OCC 2	145.25	145.25	145.25	1
Panasonic CF2700	35.00	35.00	35.00	1
Panasonic RL-H1400	11.21	11.21	11.21	1
Philips Videopac G7000	11.00	17.40	30.00	5
Pioneer PX-7	41.00	41.00	41.00	1
Psion Workabout	72.00	72.00	72.00	1
Radofin Aquarius	6.97	20.63	34.30	2
Robik	48.97	48.97	48.97	1
Sekon	72.00	72.00	72.00	1
Sharp MZ-700	16.00	52.10	82.50	5
Sharp PC-1500	7.00	28.83	42.50	4
Sharp PC-1501	20.00	20.00	20.00	1
Sinclair QL	23.00	62.80	102.00	5



Sinclair Spectrum 16K	21.00	38.33	52.00	3
Sinclair Spectrum 48K	4.00	31.15	88.00	54
Sinclair Spectrum 128K	35.00	58.60	102.00	10
Sinclair Spectrum +	9.55	22.62	74.00	35
Sinclair Spectrum +2	10.00	25.34	62.00	29
Sinclair Spectrum +2A	14.50	22.56	36.00	8
Sinclair Spectrum +3	8.00	36.10	75.00	10
Sinclair Z88	16.00	32.40	51.00	5
Sinclair ZX80	55.48	173.64	325.00	11
Sinclair ZX81	2.50	36.75	80.00	31
Sony Hit-Bit HB75B	22.00	30.00	39.00	3
Spectravideo SVI 728	56.41	56.41	56.41	1
Tatung Einstein	60.00	60.00	60.00	1
Tandy 102	26.98	37.60	60.00	10
Tandy 600	34.14	34.14	34.14	1
Tandy 1000 HX	7.35	7.35	7.35	1
Tandy TRS-80 Color Comp	8.04	23.30	46.94	8
Tandy TRS-80 Color Comp 2	7.35	16.32	28.00	8
Tandy TRS-80 Color Comp 3	10.85	17.55	21.70	5
Tandy TRS-80 MC-10	13.50	19.08	29.40	3
Tandy TRS-80 Model I	35.70	53.72	35.70	2
Tandy TRS-80 Model I (kpd)	18.20	36.05	18.20	2
Tandy TRS-80 Model II	73.82	73.82	73.82	1
Tandy TRS-80 Model III	6.93	24.58	36.17	5
Tandy TRS-80 Model 4	18.20	18.20	18.20	1
Tandy TRS-80 Model 4D	98.00	98.00	98.00	1
Tandy TRS-80 Model 4P	56.70	46.20	56.70	2
Tandy TRS-80 Model 100	14.00	43.90	89.25	10
Tandy TRS-80 PC2	22.75	50.64	92.76	3
Tandy TRS-80 PC4	23.10	57.55	92.00	2
Tandy TRS-80 Pkt Computer	15.67	25.37	36.40	4
Texas Instruments TI99/4	134.00	134.00	134.00	1
Texas Instruments TI99/4A	3.85	14.97	31.00	24
Texas Instr. TI99/4A (Mk. II)	1.40	17.49	37.50	8
Texas Instruments TI CC-40	43.00	43.00	43.00	1
Thomson MO6	24.59	24.59	24.59	1
Thomson TO9	21.00	21.00	21.00	1
Timex Computer 2048	71.98	106.86	141.75	2
Timex Sinclair TS1000	3.36	23.98	80.15	19
Timex Sinclair TS1500	35.00	35.00	35.00	1
Timex Sinclair 2068	17.56	34.25	53.00	3
Tomy Tutor	72.50	72.50	72.50	1
Toshiba HX-10	12.50	23.31	41.00	8
Unipolbrit 2068	156.00	156.00	156.00	1
VTech Laser 50	10.49	10.49	10.49	1
Yamaha CX5M	22.00	23.60	25.20	2

# Consoles

	Low	Average	High	Quantity
Acetronic MPU 1000	2.50	7.17	10.50	3
Amstrad GX-4000	5.50	17.16	18.50	9
Atari 2600 (6 switcher)	10.50	29.28	71.00	10
Atari 2600 (Darth Vader)	20.00	20.00	20.00	1
Atari 2600 Jr.	3.00	15.17	34.01	9
Atari Jaguar	24.00	24.00	24.00	1
Atari XEGS	12.50	15.75	12.50	2
CBS ColecoVision	16.00	18.75	21.50	2
Commodore Amiga CD32	26.00	30.43	40.00	7
Commodore CDTV	50.00	50.50	51.00	2
Goldstar 3D0	31.80	31.80	31.80	1
Grandstand Adman	21.00	23.50	26.00	2
Hanimex TVG070C	13.23	13.23	13.23	1
Mattel Intellivision	8.00	20.33	33.00	3
MB Vectrex	62.00	94.46	128.50	7
NEC PC FX	82.00	82.00	82.00	1
Nintendo Famicom	28.21	28.21	28.21	1
Nintendo Gameboy	14.26	14.26	14.26	1
Nintendo NES	25.00	34.00	46.00	3
Nintendo SNES	11.00	37.61	76.44	4
Nintendo VirtualBoy	44.27	62.13	80.00	2
Panasonic 3D0 FZ-1	51.00	51.00	51.00	1
Panasonic 3D0 FZ-10	31.00	31.00	31.00	1
PC Engine Core Grafx	67.50	72.61	77.73	2
PC Engine Turbo Grafx	75.00	75.00	75.00	1
PC Engine Turbo Grafx Express	110.00	110.00	110.00	1
Philips CDi 205	28.00	28.00	28.00	1
Philips CDi 210	30.69	30.69	30.69	1
Philips CDi 220	21.01	37.34	60.00	3
Philips CDi 450	28.00	28.00	28.00	1
Sega Game Gear	13.10	13.10	13.10	1
Sega Master System	20.00	24.75	32.00	4
Sega Master System II	21.00	21.00	21.00	1
Sega MegaDrive II	16.00	16.00	16.00	1
Sega Saturn	17.03	18.84	20.66	2
SNK NeoGeo CD102.00	102.00	102.00	102.00	1
Worlds of Wonder Action Max	10.00	10.00	10.00	1

## Why is the console list so small compared with the computer list ?

Although Retro Review tries to give as much focus on Consoles as we do on computers, the later are much easier to get the value from, mainly because consoles are usually sold with many games that distort their value.